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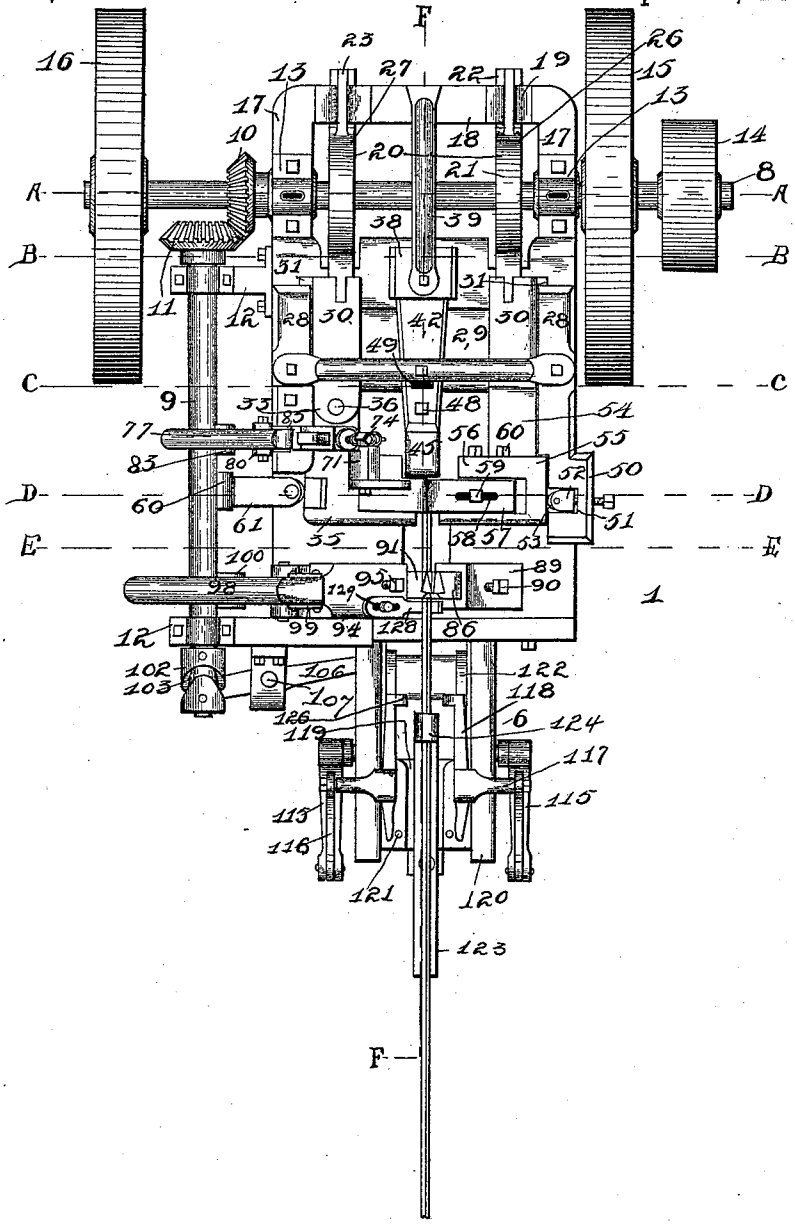
A. BARROWS.

SPIKE MACHINE.

No. 538,576. Patented Apr. 30, 1895.

FIG. 1.



Witnesses

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(No Model.) 8 Sheets—Sheet 2.

A. BARROWS.

SPIKE MACHINE.

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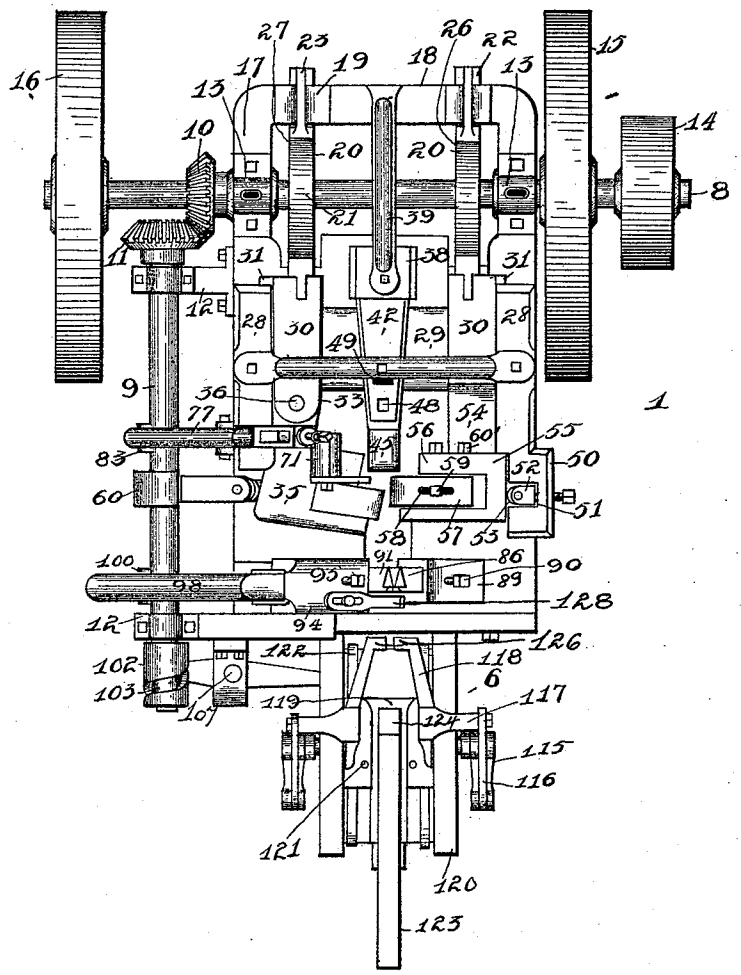
Fig. 2



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(No Model.) 8 Sheets—Sheet 3.

A. BARROWS.

SPIKE MACHINE.

No. 538,576. Patented Apr. 30, 1895.

Fig. 3

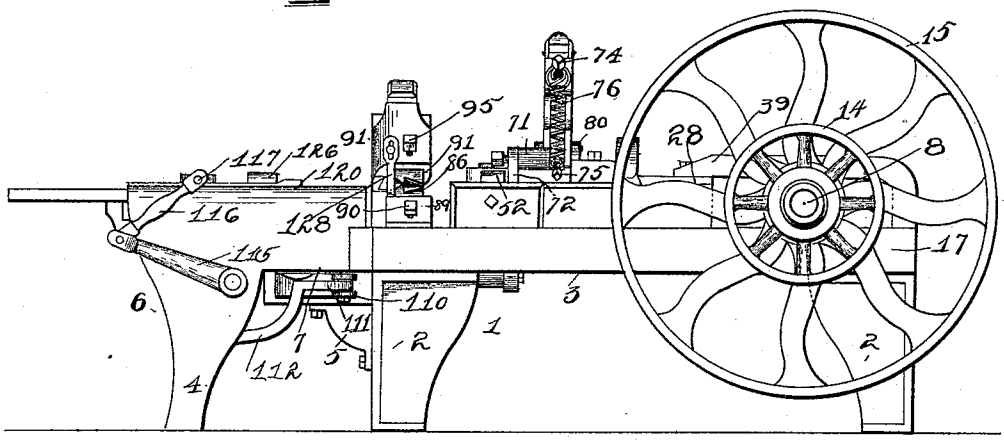
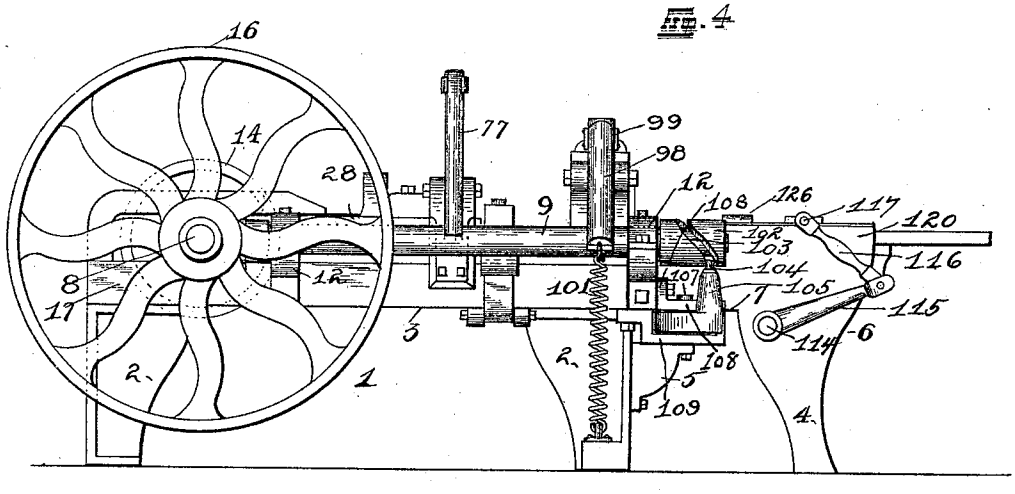


Fig. 4



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(No Model.) 8 Sheets—Sheet 4.

A. BARROWS.

SPIKE MACHINE.

No. 538,576. Patented Apr. 30, 1895.

FIG. 5

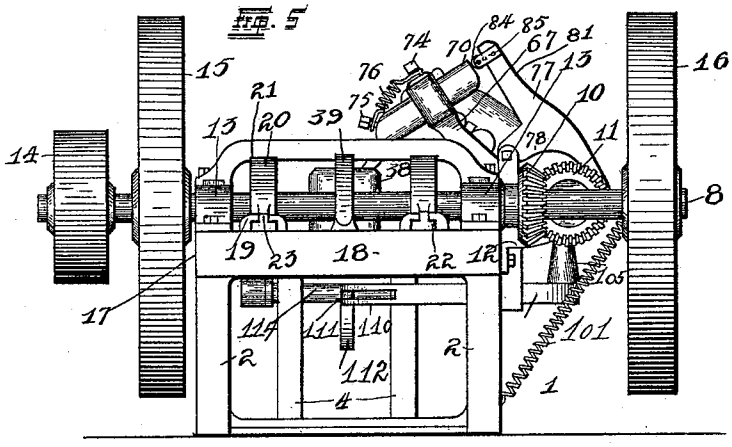
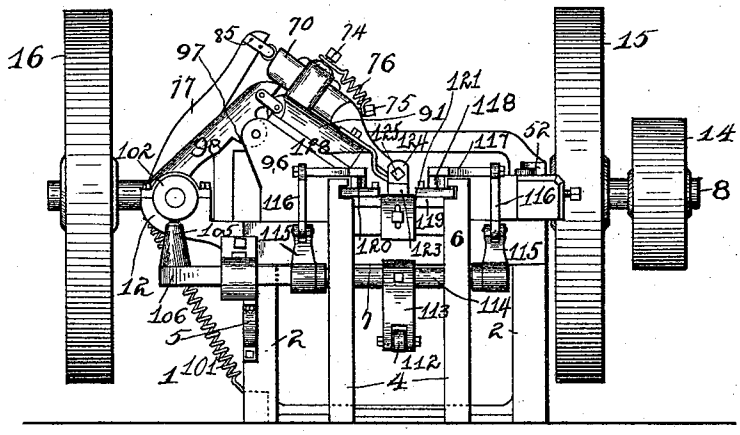


FIG. 6



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A. BARROWS.

SPIKE MACHINE.

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Fig. 7

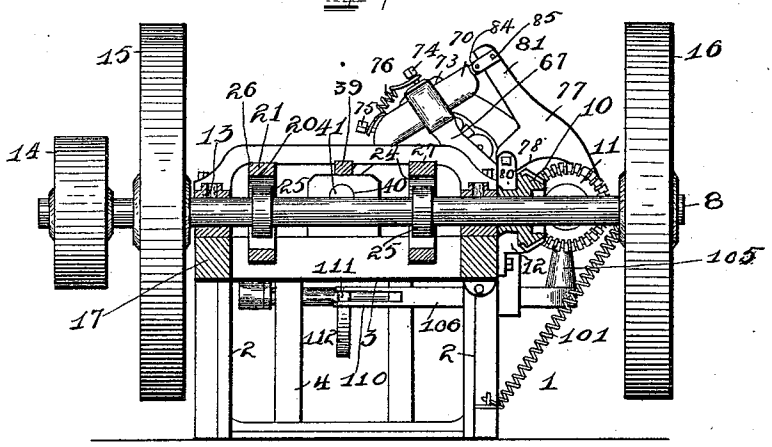
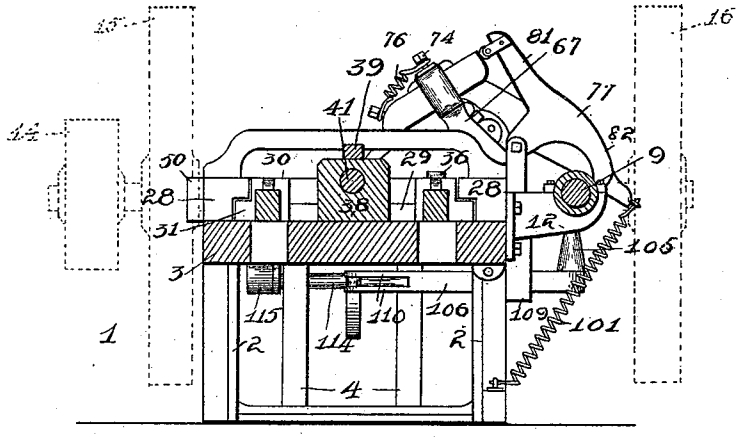


Fig. 8



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(No Model.) 8 Sheets—Sheet 6.

A. BARROWS.

SPIKE MACHINE.

No. 538,576. Patented Apr. 30, 1895.

Fig. 9

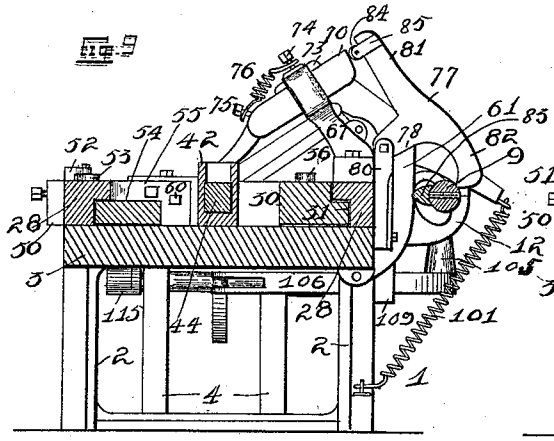


Fig. 10

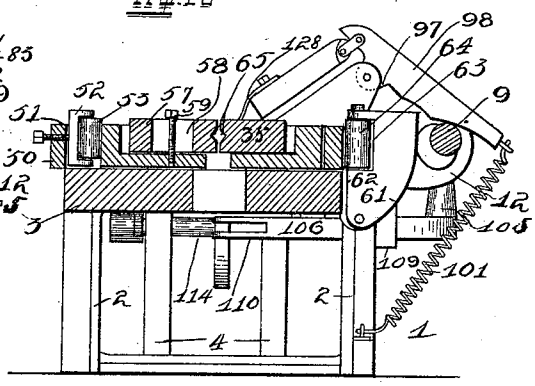


Fig. 11

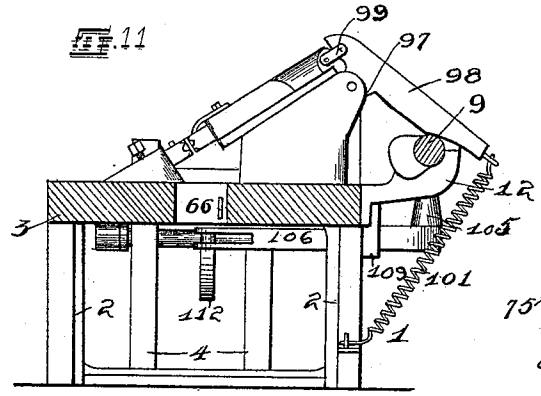


Fig. 12

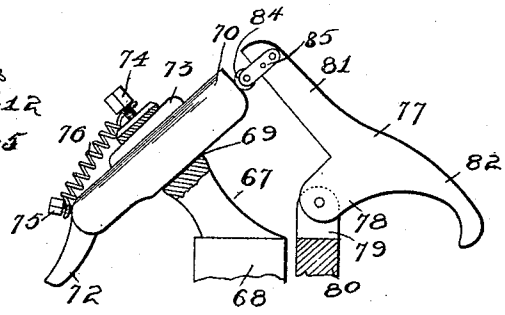
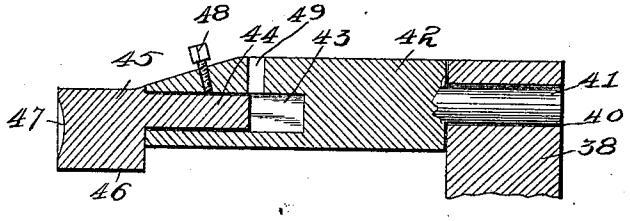


Fig. 13



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(No Model.) 8 Sheets—Sheet 7.

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Fig. 14.

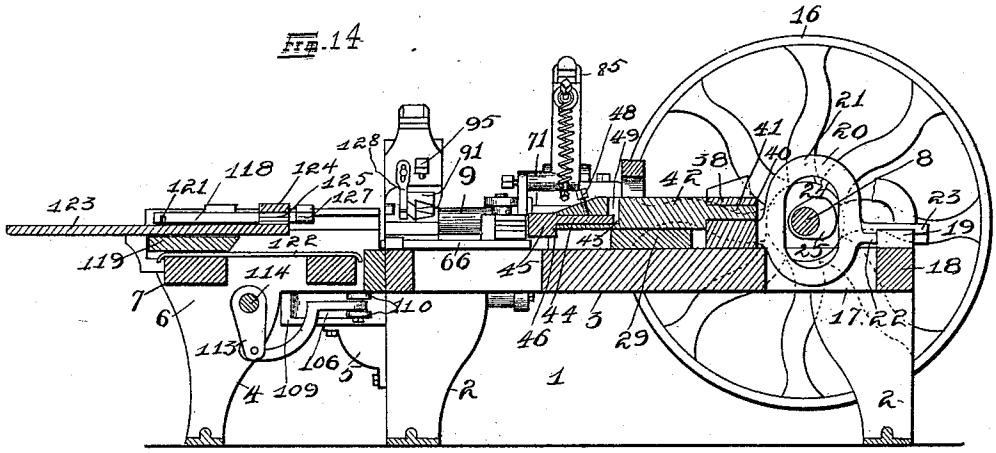


Fig. 15.

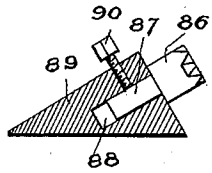


Fig. 16.

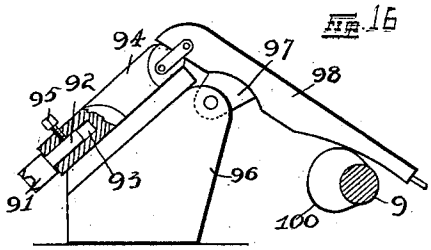


Fig. 17.

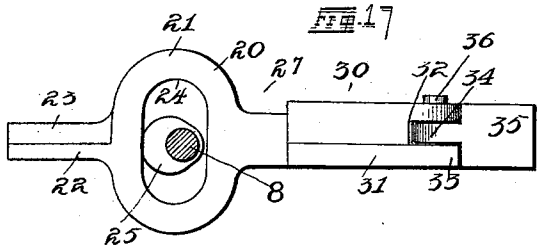
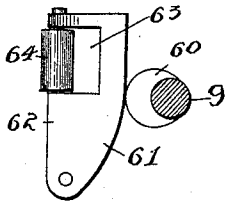


Fig. 18.



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SPIKE MACHINE.

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Fig. 19.

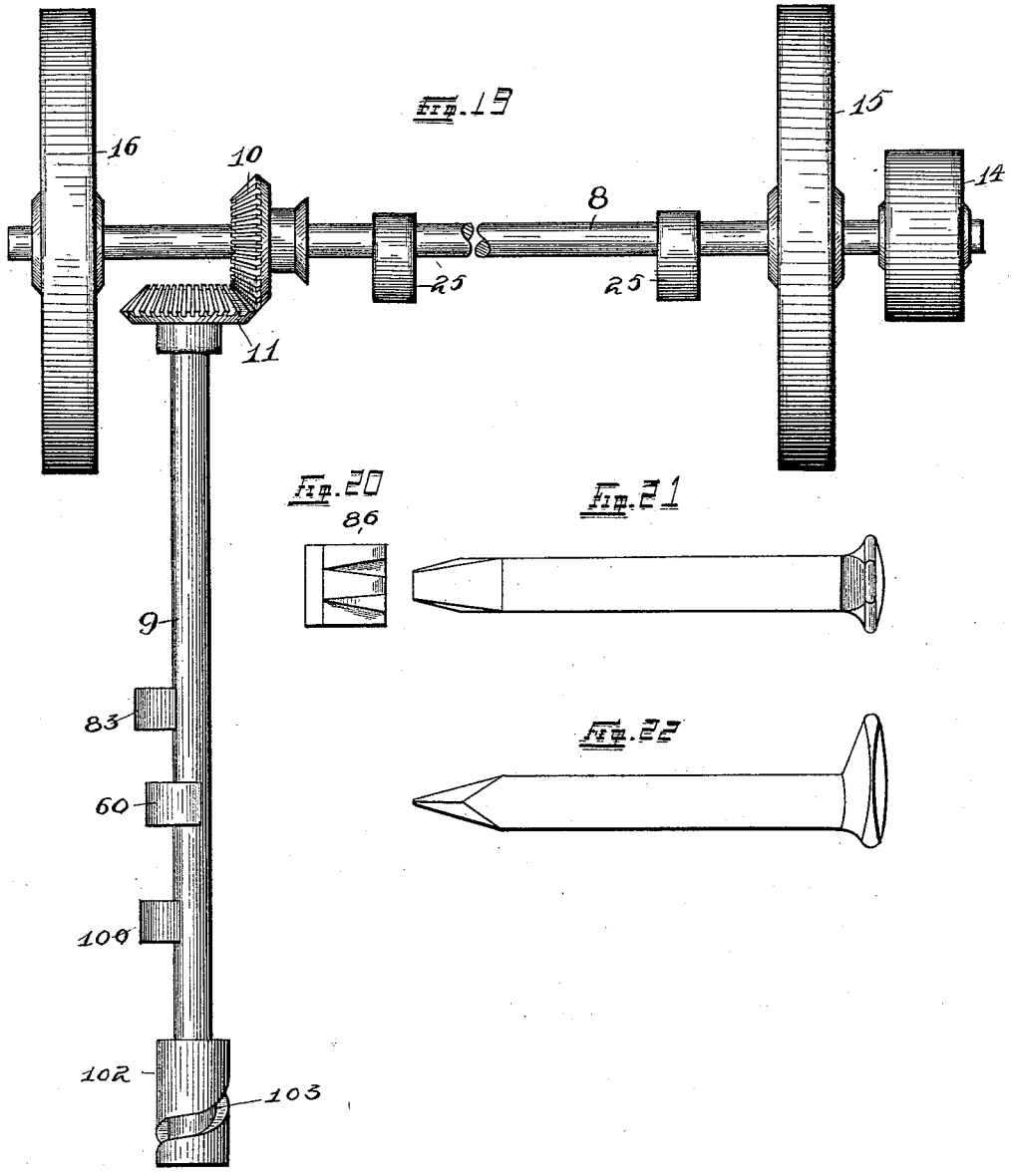

Fig. 20.

Fig. 21.

Fig. 22.

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UNITED STATES PATENT OFFICE.

ANDREW BARROWS, OF EAST ST. LOUIS, ILLINOIS.

SPIKE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 538,576, dated April 30, 1895.

Application filed June 5, 1893. Serial No. 476,671. (No model.)

To all whom it may concern:

Be it known that I, ANDREW BARROWS, a citizen of the United States, residing at East St. Louis, in the county of St. Clair and State of Illinois, have invented certain new and useful Improvements in Spike-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in spike machines, and its object is to improve upon the the construction of machines for manufacturing a certain class of spikes generally used in railway construction. A spike for this purpose must be pointed to a certain extent and have a large head in order that the engagement of the head over the base flange of the rail will be permanent.

I have found that it is practically impossible to successfully manufacture the spike complete with head and point, in a single machine, and the changing of a formed blank from one machine to another is not practicable. There are a number of reasons for this, among which I might mention the fact that the transferring of the blank to another machine allows a certain cooling off of the metal which prevents it from being properly drawn in the pointing machine, thereby necessitating the reformation of the blank.

The principal object therefore of my machine is to enable both the formation of the large head upon one end of the blank, and the pointed opposite end of the same.

To this end my invention consists in certain novel constructions and combinations hereinafter described and claimed.

In the drawings, Figure 1 is a plan view of my complete invention, showing the parts in the act of forming the head of the spike, separating the same from the main bar simultaneous with the formation of the point, and the feeder about to re-engage the bar. Fig. 2 is a top plan view of the machine with the parts in a position assumed when the bar passes the cutters and before the spike has been in any way shaped. Fig. 3 is a side elevation looking from the right at Fig. 1. Fig. 4 is a side elevation looking from the left at Fig. 1. Fig. 5 is an end elevation looking from the top at Fig. 1. Fig. 6 is an end elevation looking from the bottom at Fig. 1. Fig. 7 is a detail transverse vertical sectional view taken on a line A A in Fig. 1. Fig. 8 is a detail transverse vertical sectional view taken on a line B B in Fig. 1. Fig. 9 is a detail transverse vertical sectional view taken on a line C C in Fig. 1. Fig. 10 is a detail transverse vertical sectional view taken on a line D D in Fig. 1. Fig. 11 is a detail transverse vertical sectional view taken on a line E E in Fig. 1. Fig. 12 is a detail enlarged vertical sectional view of a portion of the header attachment and its operative connections with other parts. Fig. 13 is a longitudinal enlarged sectional view of a portion of the head-forming mechanism. Fig. 14 is a longitudinal vertical sectional view taken on a line F F in Fig. 1. Fig. 15 is an enlarged sectional view of one of the parts showing the adjustable means for changing the location of the cutter npou one side of the machine. Fig. 16 is an enlarged sectional view of the other cutter, its connection with other parts, and the connection of the cutter-holder and a cam upon the main shaft. Fig. 17 is an enlarged side view of one of the header parts, operated from a cam mounted upon the driving-shaft, as shown. Fig. 18 is a side sectional view of one of the parts which operates adjacent the main shaft. Fig. 19 is an enlarged top plan view of the driving and main shafts, showing all of the parts which are directly mounted upon or secured to the same. Fig. 20 is an enlarged inner side elevation of one of the cutters. Fig. 21 is an enlarged view of one side of the spike with the point in position as it leaves the cutter shown in Fig. 20. Fig. 22 is an additional enlarged side elevation of the spike.

The sections A, B, C, D and E, shown in Figs. 7, 8, 9, 10 and 11 as taken on the several lines in Fig. 1 are all looking at the top of the machine as shown in Fig. 1.

Referring to the drawings:—1 indicates the foundation, or what might more properly be termed the base construction of my invention. This supporting base usually consists of four main standards 2, which support a bed-plate 3. There are also standards 4, which support the feeding attachment, the same being aided

in this function by a connecting bracket 5 bolted to one of the standards 2.

The feeding attachment 6 has a bed-plate 7, which together with the direct feeding parts, is detachable from the main portion of the machine.

The bed-plates 3 and 7 are provided with a number of openings which allow the operation and location of certain parts, as will be hereinafter described.

The machine is provided with two main shafts, one of which I term the driving shaft 8, and the other a main shaft 9. The connection between the two shafts 8 and 9 is maintained by means of intermediate bevel-gears, a gear 10 upon the shaft 8, adjacent the bed-plate 3, and a gear 11 upon the end of the main shaft 9, said gears meshing into each other.

Extending from the side of the bed-plate 3, are lugs 12 which provide the bearing for the shaft 9, and pillow blocks 13 upon each side of the bed-plate 3, and above the same provide the bearings for the shaft 8.

Located upon one end of the shaft 8 is a driving pulley 14, and between said pulley and the bed-frame 3, upon said shaft 8 is a fly-wheel 15.

Upon the opposite end of the shaft 8, to that upon which the pulley 14 is mounted, is another fly-wheel 16. The object of providing the driving shaft 8 with two fly-wheels, is in order that the running over or under of the machine may be obviated to a great extent. This forms an important factor in the successful operation of machines of this character, as it tends to assist in the output of a better class of work.

The extending arms 17 of the bed-plate 3 upon which the pillow-blocks 13 are located project some distance from the main part of the frame, and are connected by a cross-arm 18.

In Fig. 5 is seen the guides 19 which surmount the cross-arms 18, said guides providing bearings for two horizontally and longitudinally reciprocatory travelers 20. The above term is thought to clearly give a concise idea of the operation and function of the part. The main portion 21 of the traveler 20 somewhat resembles an O in side elevation, with a projecting web 22, extending from the same a little below the center, at one side. Said web is provided throughout its length with an upwardly extending rib 23. The guides 19 are the exact reverse of the web and rib in their location, so that they are operative the one within the other. I do not wish to confine myself however to this peculiar form of guide, as there are other forms which would answer the purpose equally as well. There are two of these travelers, one of the same being located within and adjacent the side extensions 17, of the bed-frame 3. The interior outline of the main portion 21 of the travelers 20 form a guide 24, in which operate two cams 25 which are suitably mounted upon the driving shaft 8. The movement of the cams during the revolutions of the shaft 8 control the longitudinally reciprocatory movement of the travelers.

I deem it best to designate the travelers by different letters of reference, as one of the same is reciprocatory in a direct line while the other has a connection with a part that has a side movement in the same plane. Therefore the traveler upon the side of the machine at which the pulley 14 is located, is indicated by the numeral 26 and the one upon the opposite side by the numeral 27. It is also thought best to refer to the machine as looking at the right and left hand, and the top and bottom of the same as shown particularly in Fig. 1. Guides are formed for controlling the movements of the lower ends of the travelers by upwardly projecting guide blocks 28, which are located at each side of the bed-frame 3 and are substantially inverted L-shaped in cross-section. The lower ends of the travelers, upon their outer sides, are just the reverse when viewed in cross section, in order to form the guides as required. It will thus be seen that the lower ends of the travelers are only guided upon their outer sides, and in order that they may be kept in their determinate positions, I have provided a central guiding block 29, which is secured upon the bed-frame 3. The lower end of the traveler 27 at the left of the machine consists of a main portion 30 with an inwardly projecting flange 31 which operates in the guide 28. The portion 30 at its lower extremity, that is toward the lower end of the machine is provided with an elongated rectangular cut-out portion 32, which forms two projecting ears 33 between which is mounted an ear 34 upon the end of a horizontally movable clamping block 35, the relation between the two being maintained by a removable stud-pin 36.

The function and operation of the movable block 35 will be hereinafter described, and I will now proceed to detail the construction of adjoining parts.

Mounted upon the bed-frame 3, below the driving shaft 8, and between the two travelers 26 and 27 is an upright block 38, which is braced to the end cross-piece 18 of the frame 3 by a connecting bar 39. The block 38 is provided with a horizontal circular bore 40 which is adapted to receive a dowel 41 upon the end of a block 42. Said block 42 is provided with a central rectangular opening 43 which extends inwardly from its free end, said opening being adapted to receive the shank 44 of the header-block 45, said block consisting of an enlarged rectangular block 46 provided in its outer face with a curvilinear depression 47, the function of which will be hereinafter described.

The above construction, as will be seen by reference to the drawings is practically stationary, although the header-block 46 is adjustable.

A set-screw 48 is located in the upper part of the block 42, and engages the shank 44 of

the header-block, in order that the same may be set to any desired length.

A vertical opening 49 extends downwardly through the upper portion of the supporting block 42 and is provided for the insertion of a wedge, in case the shank of the header-block becomes locked and it is found impossible to adjust the same by other means.

The guide block 28, governing the movement of the traveler 26 has an outward projection 50 provided in its inner side with a rectangular cut-out portion 51, which forms a guide for a frame 52 carrying a vertical roller 53 which facilitates the movement of said traveler 26. Said roller 53 engages the lower portion 54 of said traveler 26, said portion 54 being similar in cross-section to the lower portion of the traveler 27. The portion 55 upon the lower end of the main body 54 of the traveler 26, consists of two arms 56 between which is operative a clamping block 57. The two arms 56 are connected at the right or outer side of the machine and is that part of said traveler which is directly engaged by the roller 53. The block 57 is adjustable transversely with the plane of the traveler 26, and in order to attain this movement is provided with an enlongated vertical slot 58 operative over a set-screw 59. Set-screws 60′ located in the upper arm 55 are adjusted to set and lock the clamping-block 57 in any desired position.

The clamping-block 35 has heretofore been described, and I will therefore explain its connection with other parts, and their combined operation.

Located upon the shaft 9 is a cam 60 which as will be particularly seen in Fig. 18, lies entirely upon one half of the periphery of the shaft 9 and is adapted to be engaged by a horizontally oscillatory device 61 which is detailed in Fig. 18. It consists of a casting 62 having an outer curvilinear edge which is engaged by said cam 60. Said casting 62 is pivoted at its lower end between suitable bearings provided by the bed-frame 3, and in its inner side and near its upper extremity is located a cut-out portion 63 in which a projecting vertical roller 64 is mounted, said roller engaging the outer side of the pivoted block 35. The two blocks 35 and 57 are provided with triangular shaped horizontal depressions 65. When the two blocks are together, said depressions form a rectangular opening through which the heated bar is located, the same being upon its corner.

As will be seen in Fig. 14, a spring 66 is secured at one end to a portion of the bed-frame, below the clamping-block 35, and the free end of same engages said block 35 in order to compel its return to normal position when the cam 60 is not in engagement with the same.

In Fig. 12 is particularly shown a construction by means of which the movement of the clamping-blocks 35 and 57 is limited during a certain period of the operation to allow the passage of enough of the main bar, in order that enough metal is passed to the header-block 45 to form the head upon the spike. It is therefore necessary that a cam movement be made use of to periodically insert a portion of the device between the clamping-blocks and header-block. The device consists of a casting 67, a part of or formed separately from a block 68 secured upon one of the guides 28. Said arm is provided with an inclined opening 69 in which is located a movable bar 70 upon the lower end of which is secured an arm 71, at right angles with the same and provided with an interior opening in which is located the shank carrying a downwardly canted arm 72 which periodically inserts itself between the clamping-blocks and the header during the running of the machine. Located above the sliding bar 70 is a key-wedge 73 which is secured upon the inner end of a set-screw 74 which passes through a portion of the arm 67, and the object of this provision is to allow for wear upon either of the parts, in order to continually have the bearings for said bar 70 in proper condition. A set-screw 75 passes through the lower end of said bar 70 and engages the incased portion of the insert arm 72, and holds the same at the requisite angle. The two set-screws 74 and 75 also serve another purpose in providing the means for securing the two ends of a coil spring 76, which owing to its securance to the set-screws located upon different parts, compels the return of the bar 70 to its normal position. The reciprocatory movement of the bar 70 is attained through the operation of a lever 77, the same being provided with a centrally projecting arm 78, intermediate of its length and pivoted between two standards 79 projecting upwardly from a casting 80 secured to the side of the bed-frame 3. The lever 77 has two arms, one straight arm 81 and a curvilinear hook-shaped arm 82, the inner side of which is engaged by a cam or projection 83 upon the main shaft 9. Near the upper end of the arm 81 and adjacent the inner side of same, is mechanically secured a roller 84 mounted between two arms 85 secured to said arm 81. Said roller 84 engages the upper end of the bar 70, and governs its periodical movement in order that the arm 72, may at the proper time be inserted between the clamping-blocks and the header.

The construction of the machine from the upper ends, down to a point adjacent the cutting dies has been described, and I will therefore proceed to give a description of said cutters as they are next in position.

The dies have a somewhat peculiar movement in that they not only cut the spike to its proper length, but they also form the peculiar point of the spike, which is clearly shown in Figs. 21 and 22. The cutter head 86 upon the right of the machine is practically stationary, and only slightly adjustable to allow for wear. The head 86 has a shank 87, of rectangular outline when viewed in cross-section, said shank adapted to fit into an opening 88 of similar outline, in a triangular

shaped block 89 which is secured upon the bed-frame 3. A set-screw 90 is located in said casting 89 and engages the shank 87 of the cutter.

As I do not care to confine myself to the form of spikes as herein shown, I think it best to state that the cutters can be of any desired form in order to turn out such styles of spikes as may be determined upon.

The other cutter 91 has a shank 92 which is located in an opening 93 in a sliding block 94, said cutter being controlled in its position by the adjustment of a set-screw 95. The sliding block 94 is provided with suitable means for guiding its reciprocatory movement, and is canted to conform with the incline of the cutter-head 86, in order that the cutter-head 91 will meet the same. Said block 94 is elevated by an upwardly projecting casting 96, which is secured upon the bed-frame 3. The upper outer corner of said casting 96 is provided with a means for pivotally mounting a lug 97 projecting inwardly and downwardly from a bar 98. The upper end of said bar 98 is connected by toggle-levers 99 with the upper rounded end of the bar 94, thus forming a joint somewhat like a knuckle. The lower end of the lever 98 is somewhat hollowed out on the inner side and near the lower end and is engaged by a cam 100 upon the shaft 9. The application of this cam movement enables an alternate movement of the cutter die at periodical times, a downward movement of the same being necessary to shape the point of the spike and the reverse movement to release the same when complete. A spring 101 connects the free end of the lever 98 with some portion of the bed-frame, in order to compel the reverse movement of the cutter back to normal after passing the cam. The cutter heads in this instance are provided with suitable projections and depressions for the formation of a spike having a point tapering from all four sides of the shank, but flatter upon two opposite sides than upon the other two sides.

The feeding attachment as a whole is detachable from the remainder of the machine by disconnecting two of the parts as will presently be seen from the description.

Upon the shaft 9 below the lower bearing bracket 12, is mounted a circular elongated disk 102, suitably secured thereto and provided with a feather-guide 103, continuous but extending entirely around the periphery of said disk in a spiral direction.

Particular attention to Fig. 4 shows a movable feather 104 revoluble in an upright arm 105 of a horizontal pivoted, oscillatory lever 106, which is movable between parts of the bed-frame and upon a vertical stud-pin 107. The bearings between which the lever 106 is mounted, is provided by brackets 108 and 109 secured to the bed-frame 3 and standards 2 respectively and said lever projects inwardly under the bed-plate 7 of the feeding attachment 6. The inner end of said lever 106 is approximately under the center of the attachment, and is provided with two ears 110 between which is mounted the horizontal portion 111 of a connecting toggle-lever 112. The remainder of said lever 112 is downwardly and outwardly curved and pivoted between two ears upon the extremity of a crank 113 mounted upon a horizontal shaft 114, suitable bearings for which are provided in the standard 4. Said shaft 114 projects outwardly from each side of said standards 4, and upon said extending ends are keyed two connecting toggle-levers 115 which somewhat resemble the ordinary crank in their movement and function. The upper ends of said levers 115 provide a means for the mounting of another pair of toggle-levers 116 the upper ends of which are revolubly mounted upon projecting studs 117 upon two horizontal, oscillatory gripping arms 118. Said gripping arms 118 are pivoted a little to the rear of their center upon a traveling crosshead 119, suitable bearings for which are provided by guides 120 located upon the bed-plate 7 of the feeding attachment. Stop pins 121 are located upon said traveler 119 to limit the opening movement of said arms 118. The movement of said levers is such that during the backward movement of the gripping arms 118, they are distended to allow an easy passage over the heated bar which is being passed through the attachment from the heating rolls. Simultaneous with the slightest forward movement of said gripping arms 118, said arms clamp together over the rod and the operation of the parts by the traveling of the feather 104 in the guide 103 causes the forward feeding movement of the arms to feed the bar to the header-block 45. Two flat steel springs 122 located under the crosshead 119, tends to keep the same in tension against its upper guides in order to allow for the wearing of parts. A horizontally adjustable guide 123 is suitably secured to some portion of the bed of the attachment and in its upper end is provided with an enlarged portion 124 in which is located an opening 125 through which said bar is fed. Said opening 125 is rectangular in its outline and in such a position as to pass the bar through upon its corner, while the inner faces of the forward ends 126 of the grip arms are provided with similarly outlined depressions 127 to grip the bar. Secured upon the upper face of the traveling block 94 and adjoining the cutter-head 91 is a supporting L-shaped iron 128 provided with an elongated slot 129 by means of which it is adjustable to different lengths. The iron 128 serves two functions in that it assists in the guidance of the bar through the cutters, and also insures the disengagement of the spike after the point has been formed and cut with its upward movement simultaneous with the movement of the upper cutter-head owing to its securance upon the same block. The spike at this point in the operation of the machine is formally held between

the clamping blocks 35 and 57 and therefore the upward movement of the block upon which the iron 128 is secured insures the separation of the spike from the bar by means of the engagement of the projection upon said iron 128 with the under side of the main bar.

It is now believed that all of the mechanical parts of the invention as well as their applied principles have been fully summed up, and I will therefore proceed to describe the operation of the machine by steps.

In Fig. 1 the parts are in a position with the spike formed complete and ready to drop into some receptacle placed under the machine for the purpose, while in Fig. 2 the parts are in a position for a bar to be fed up against the header-block. As these two views so clearly show the position of the different parts, together with the relative location of the cams upon the shaft 9 and the different parts similarly placed, I deem it unnecessary to enter into a very specific description of the movements of parts in their rotation. The bar having been fed to the header-block, is grasped by the clamping blocks 35 and 57 while the arm 72 passes downwardly between said clamping blocks and the header block until the point has been formed upon the machine. At this juncture the clamping blocks move toward the upper end of the machine thus compressing the heated metal and forming the head. When the head has been formed complete the bar which is being fed into the machine passes again to the header-block after the finished spike has dropped from the machine.

The operation of the parts are successive in order that the best results can be obtained and it has been found that the particular arrangement of the parts in order to bring about the successive operation is highly successful in all of its movements.

All of the parts are constructed with a view to lightness of weight, strength in durability, and cheapness in cost, while the machine being perfect in all details does not require the skilled labor for the successful output of the work.

Heretofore in the operation of machines of this class it has been necessary to employ several or more laborers to successfully guide the operation of the machine and the heated metal thereinto, in order that as small a number of imperfect spikes as possible would be formed.

It is believed that with my improvement it will be only necessary to employ one mechanic to carry on the operation of the machine as no hand assistance is necessary for its operation, the feeding attachment serving to pass the heated metal into the machine, and its own operation to turn out the spikes. Therefore the only attention requisite for the machine is to keep the bearings and cams in proper order and to prevent against any mishaps from the breakage or displacement of the parts.

I again desire to state that I have tried in this improvement to make up for a great many deficiencies which I have found in machines which I have been manufacturing and operating and as my knowledge of the art is considerable I believe my statements to be well grounded.

Having fully described my invention, what I claim as new is—

1. In a spike machine, the combination of a feeding attachment; clamping blocks to grip the heated bar from which the spikes are to be formed; a header block; and means for allowing the passage of enough of the heated bar between the clamping blocks and header blocks to form the head upon the spike, said means comprising a cam-operated lever, 77, a tilting bar adjacent to and operated by said lever, and an arm carried by the tilting bar and adapted to periodically insert itself between said clamping block and header block.

2. The combination of the driving shaft carrying the cams and provided at one end with a bevel-gear wheel; a main shaft, 9, having a gear wheel at one end meshing with the bevel-gear wheel on the drive-shaft and a disk provided with a cam groove on its other end and cams between the two ends; two longitudinally-reciprocatory travelers operated by the cams on the drive shaft; a feeding attachment having an arm playing in the groove of the cam-grooved disk on the main shaft; a clamping block, 35; another clamping block, 57, adjacent to said block, 35, both having depressions to form an opening for the heated spike bar; means operated by a cam on the main shaft to move the clamping block, 35, toward the clamping block, 57, to clamp the heated bar; a header block; two cutter heads, one of which is stationary, and the other actuated to reciprocate by a cam on the main shaft; and means for allowing the passage of enough of the heated bar to form the head of the spike.

3. In a spike machine, the combination of a feeding attachment; a header block; cutter heads; clamping blocks which compress the heated bar against the header block to form the head of the spike; and a canted reciprocatory sliding block having a projection which engages the clamping blocks to disengage the finished spike.

4. In a spike making machine, a heading mechanism consisting of a header block, two longitudinally moving travelers adjacent thereto, provided with clamping heads one of the said travelers having its clamping heads pivoted thereto, and means for tilting the pivoted head toward the opposite clamping head to engage the spike bar, substantially as described.

5. In a spike making machine a heading mechanism consisting of a header block, two travelers adjacent thereto, provided with clamping heads, one of the said travelers having its clamping head pivoted thereto, a cam acting upon the pivoted head and tilting it toward the opposite clamping head, to engage

the spike bar, a lever adapted to be inserted between the clamping heads and header block to permit the passage of enough of the bar to form the head, and means for moving the said travelers longitudinally, rotating the said cam, and actuating the said lever, substantially as described.

6. In a spike making machine, the combination with intermittently acting feed mechanism for the spike bar, of a cutter therefor, a header block, two travelers adjacent thereto, provided with clamping heads, one of the travelers having its clamping head pivoted thereto, a pivoted casting, provided with a roller bearing on the pivoted header block; a cam adapted to actuate the said casting to tilt the pivoted clamping head to engage the spike bar, a lever adapted to be inserted between the clamping heads and header block to permit the passage of enough of the bar to form the head, and means for moving the travelers longitudinally and actuating the cutter, the lever and feeding mechanism and rotating the cam, substantially as described.

7. In a spike making machine, the combination with intermittently acting feed mechanism, of two cutter heads, one of the heads being stationary and the other movable, the said heads being aligned in a line perpendicular to a flat face of the spike rod, a header block and two longitudinally movable clamping heads, one of the said heads being pivoted, and moving in a plane substantially parallel to a diagonal of the spike rod, and means for tilting the pivoted head in its said plane of motion and moving one of the cutter heads, and both the clamping heads, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW BARROWS.

Witnesses:
IDA C. ENGELHARD,
MAR A. BARROWS.